



Tips for Getting Started with Alignment Scopes

When designing the MetroLinq™, we knew a tool was needed to help align a 1° antenna beam. We examined several types of optical tools. After launching, we chose a right angle viewer that rotated, giving the installer flexibility. The 9x50 magnification allows for clarity on the longest links. Anyone who is familiar with scopes knows, optics always come with some inherent variability. We tried to make the scope as robust as possible by removing the need for constant calibration.

On an install a few weeks ago, our customer had a set of scopes for the alignment. However, we preferred to use our set as our installer is familiar with how his scopes align. In an effort to help others, we realized we needed to share what we've learned with our customers. We have completed several dozen alignments and have seen it all. With that in mind, here is what we know about our scopes:

1. If you have an existing link that is linked and optimized, you can simply attach your new scope to the units and find where the cross hairs are relative to the far side unit. If you have multiple links, we suggest you try them all to get a better understanding of our scopes through practice.
2. If you are diving in without an existing link, we strongly suggest doing a relatively short link (50 ~100 meters) with movable tripods. Use the scope to start and align to the cross hairs*. Once booted up, you should be linked and able to pass traffic. In the event the units do not link, you may need to adjust the alignment slightly. Once you have the link, maximize the RSSI by adjusting the alignment slightly in all directions. Once you have the signal optimized note the cross hair position relative to the far unit. Due to reflections, this position may or may not be accurate. To ensure reflections are not playing a role, move one unit back by 1m and repeat the process. You can also move the unit vertically by 1m if it is easier. If the cross hair position remains consistent between both alignments, you most likely are not seeing reflections. If you are seeing results shift significantly you should repeat the move by 1m until you can get consistent results.

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IgniteNet

www.ignitenet.com

MetroLinq 60GHz
w/ 5GHz backup

- Outdoor PTP and PTMP
- Interference free
- 1 Gbps+

Once you have your baseline understanding from previous steps, you are ready to try a long link! A few notes going forward:

- If your cross hairs are 50cm below the unit at the short link the position will not aim 50cm low at the longer distance. You don't need to use trigonometry, but make sure you understand the base line measurements are relative.
- Your longer links may see a variance in the alignment if reflections are present. If possible, try moving 1m. And preferably, make sure you have the ability to make small adjustments as needed.

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60GHz PTP/PTMP Aiming Mode & App – Linq Assist™

With the release of firmware version v1.1.4 for IgniteNet's MetroLinq™ platform, we are pleased to announce the introduction of a new and improved web GUI based Aiming Mode along with support for our new Linq Assist™ app for iOS and Android mobile devices. This new Aiming Mode provides faster initialization, more precise results, improved responsiveness, and a more intuitive operational process than previous implementations. This, in conjunction with the ease of use of the Linq Assist app, will greatly improve your link alignment and installation experience.

Aiming Mode - PTP

When you first update from an older firmware version to v1.1.4, you will find that on the 60Ghz Point-to-Point Auto operation mode has been replaced with two options, Point-to-Point Master and Point-to-Point Client as seen below.



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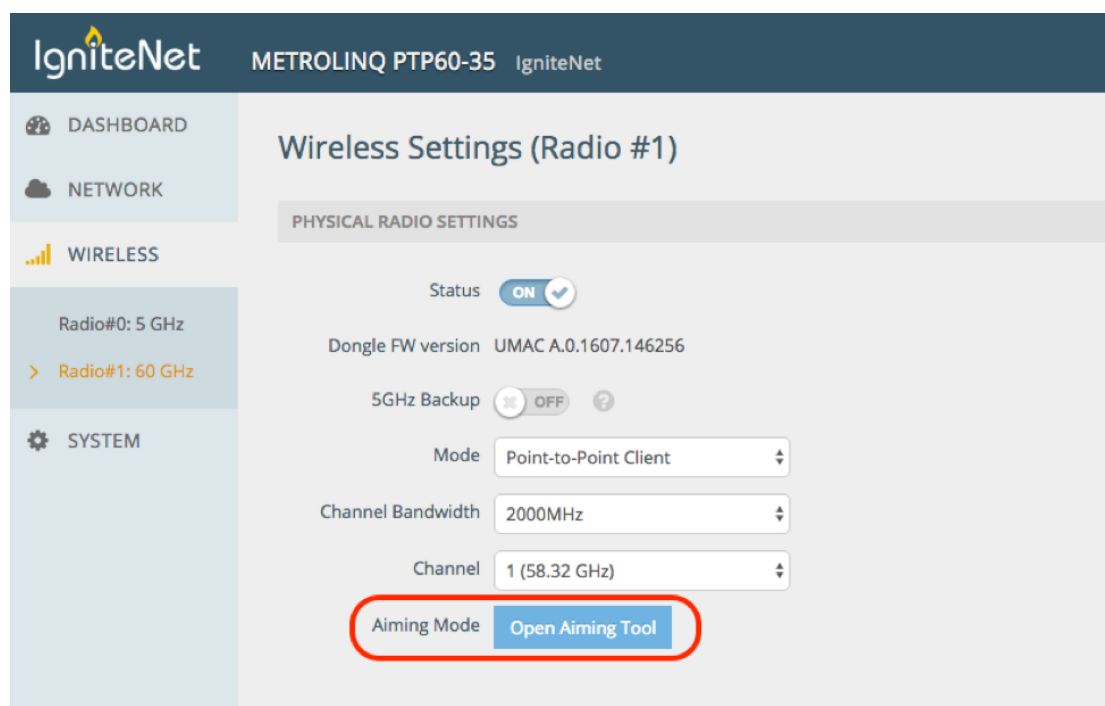
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When you update from an older version which began in Point-to-Point Auto mode, each radio will then default to Point-to-Point Master. Don't worry! The Point-to-Point mode does not matter for link operation, and having both sides on this same mode will not cause link problems. It only matters when using the Aiming Mode. For Aiming Mode to operate normally, one side has to be the Master, and the other side has to be the Client. The Client side is the side that starts the internal Aiming Mode process, and while the Master side will display the relevant signal information when the Aiming Mode is started on that side, the Client side is what drives the operation.

Before beginning alignment, configure the radios and make sure the channels on both sides are the same, the SSIDs are the same, leave encryption off for now, set the data rate to MCS1, and ensure the ACK settings are set for the appropriate distance.

To use the Aiming Mode, set one side to Point-to-Point Client and the other side to Point-to-Point Master. On the Client side, click on the Open Aiming Tool button as shown below.



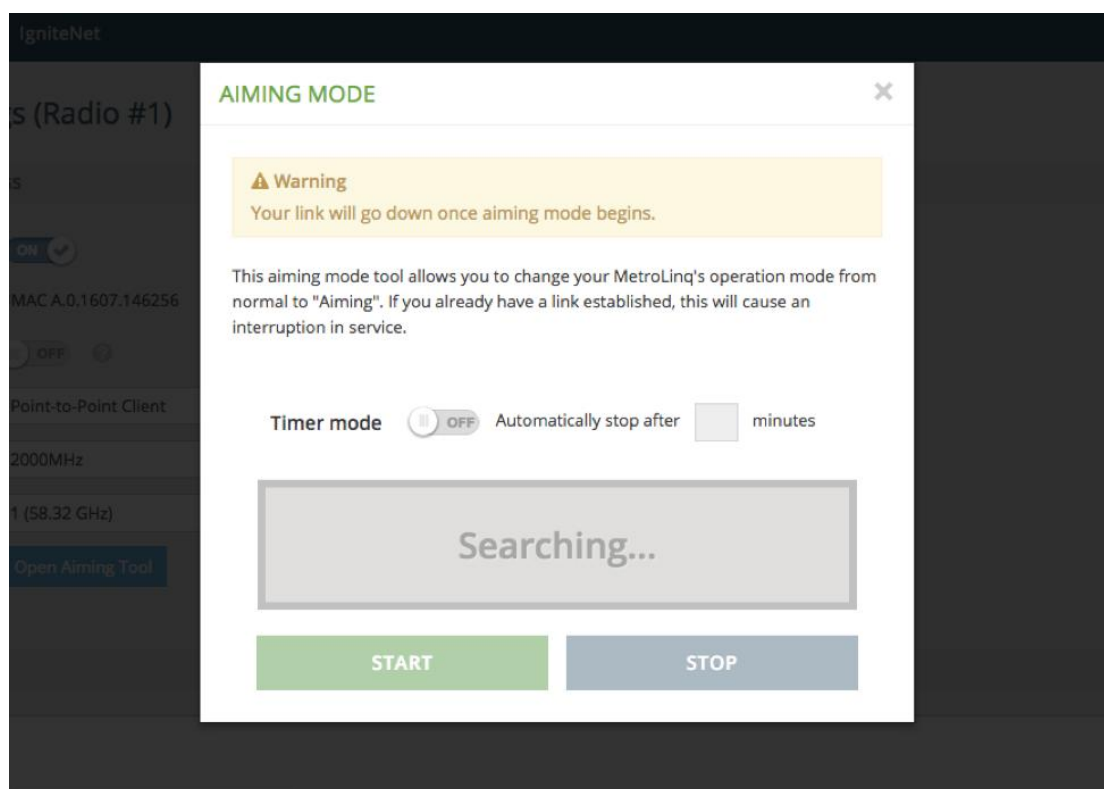
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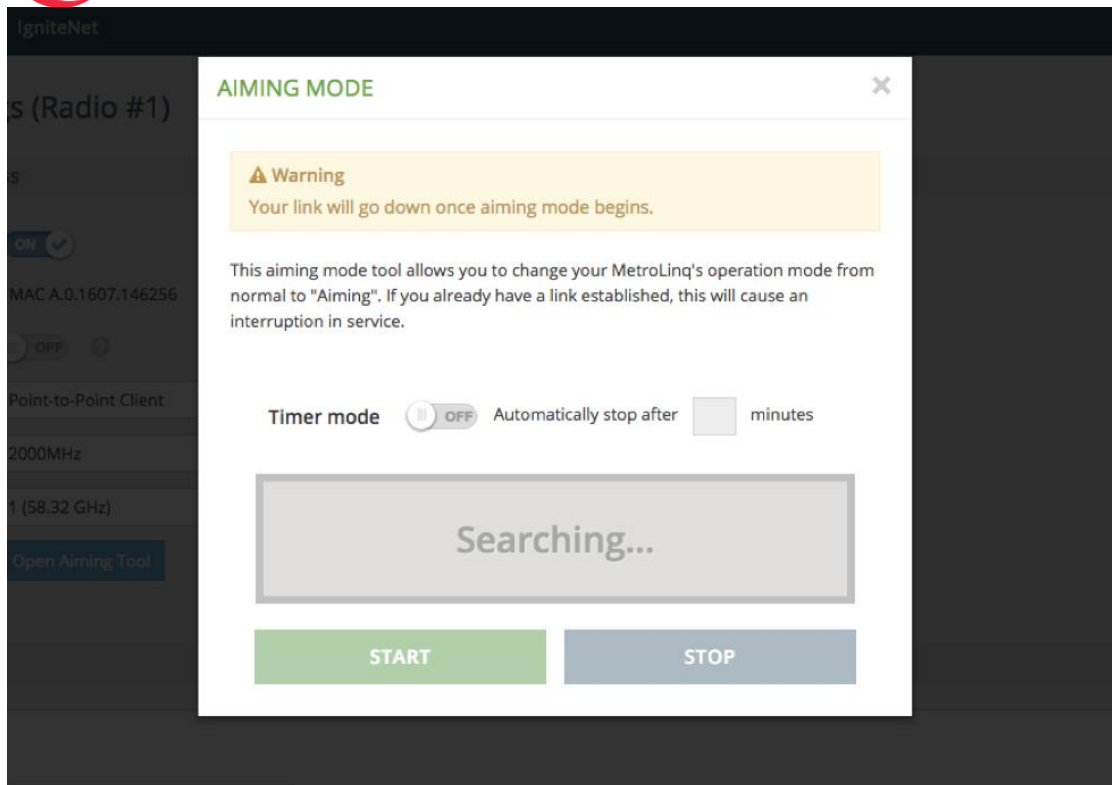
Once the Aiming Mode page pops up, press Start and it will start scanning for Master units as shown below.

NOTE: Once you start the Aiming Mode from the Client side, the link will drop (if previous associated) and you won't be able to reach the other side via the link. If you are aiming one side at a time, you can set the timer on the Client side (while adjusting Master Side) to run for X minutes at a time. This will allow for the link to re-establish to you can reach the other side again once the timer expires.



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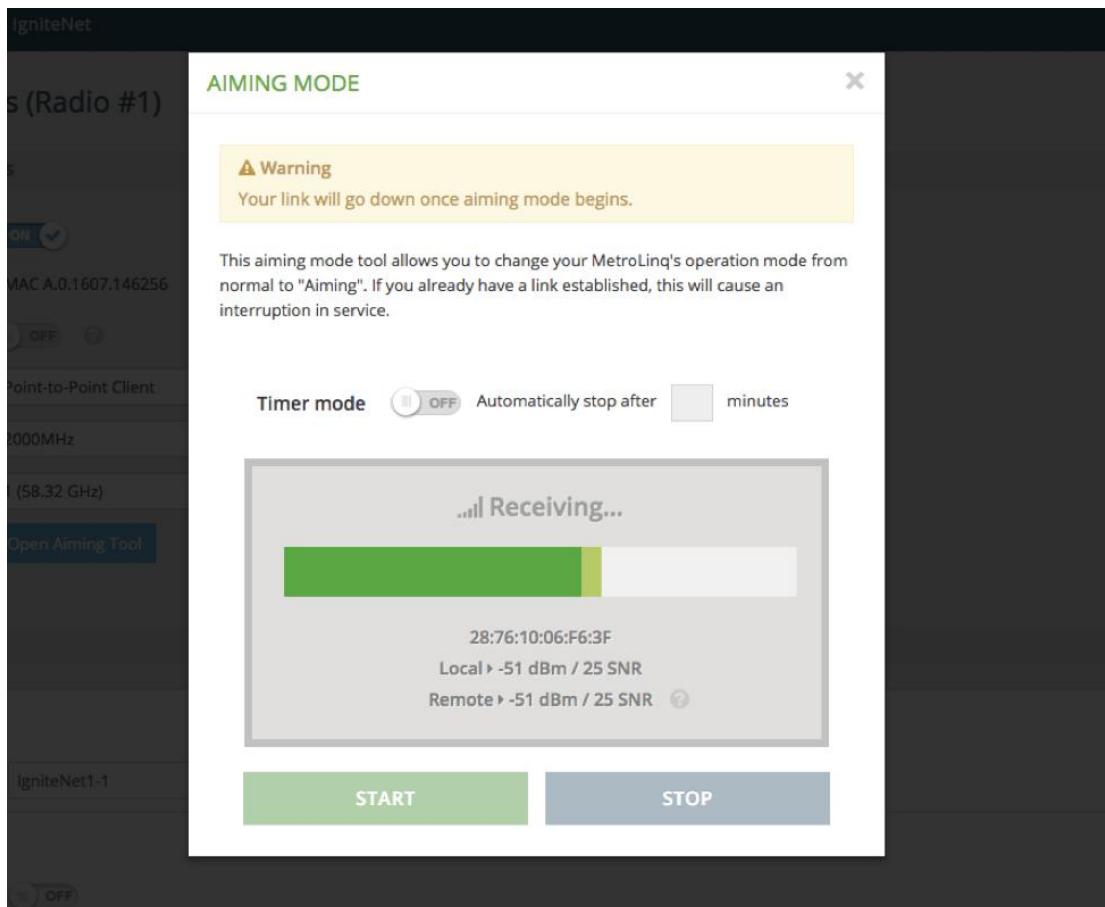
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Once the Client sees a Master unit, it will display the MAC of the Master, the Local and Remote RSSI and SNR values, and a signal bar that shows the current signal strength and the highest level seen as seen below.

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NOTE: The MAC shown is the MAC address of the 60GHz interface of the other side, and not its main system MAC. You can find the 60GHz MAC address of a device in question by looking at the Wireless Status section of the Dashboard as seen below. We suggest noting all MAC's used for a link during initial updating and configuration to keep in your records. If the Client sees two Master units in the scan, both will be displayed with corresponding MAC addresses and signal bars.

WIRELESS RADIO #1 (60 GHZ) (IN USE)

CONNECTED TO IGNITENET1-1

-49 dBm

RSSI: -49 dBm

-51 dBm

Remote RSSI: -51 dBm

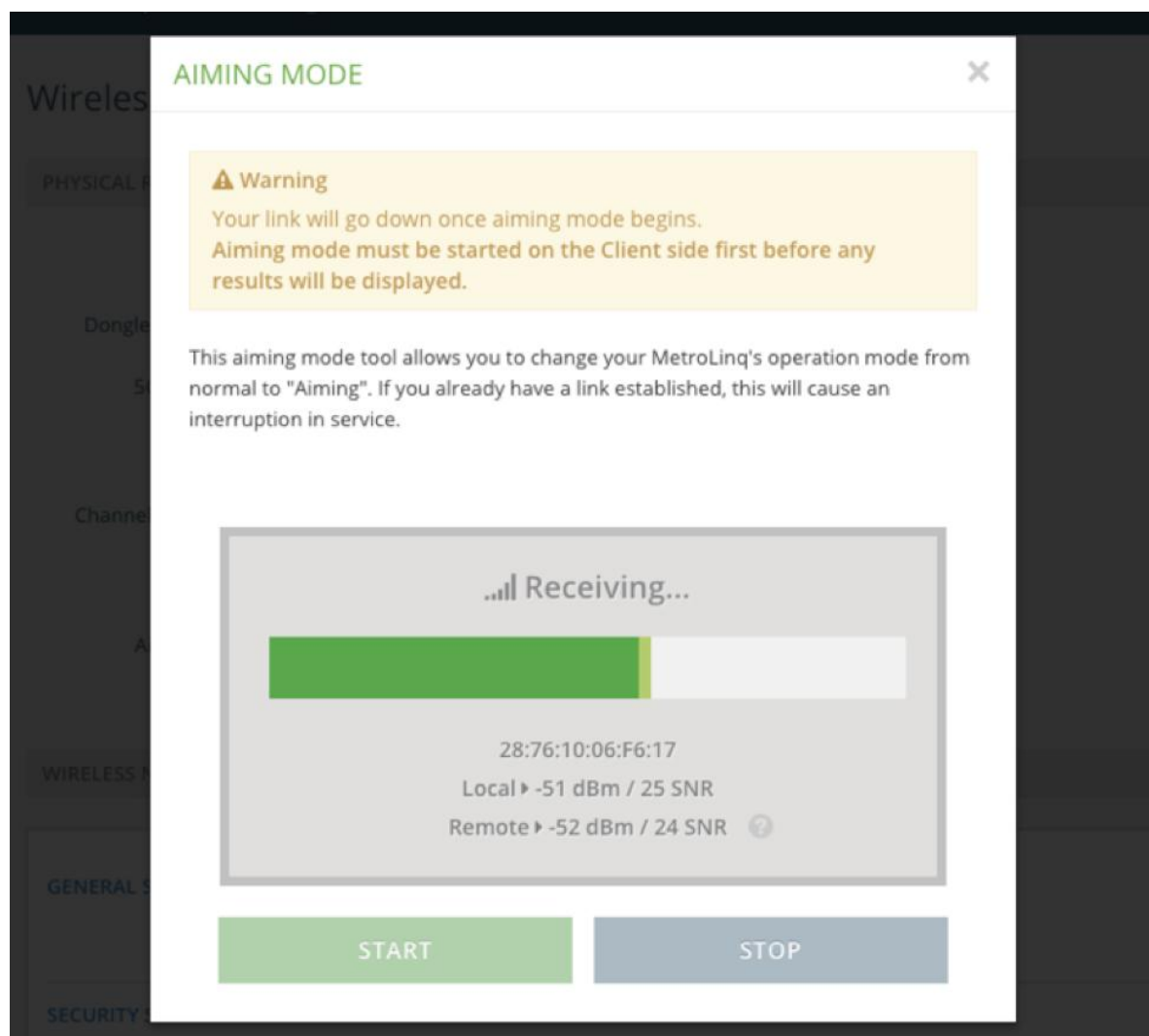
RADIO STATUS	▶ Enabled	LOCAL MAC	▶ 28:76:10:06:F6:3F
OP MODE	▶ Point-to-Point Master	DATA RATE	▶ Tx: 1251.25 Mbps
REMOTE MAC	▶ 28:76:10:06:F6:17	TX POWER	▶ -6 dBm (US)
SECURITY	▶ Disabled	CHANNEL	▶ 1 (58.32 GHz) @ 2000 MHz

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When logged into the GUI on the Master, you can also see this alignment information. Please note again that the Aiming Mode on the Master will not display any information until the Aiming Mode on the Client unit has been started. It looks quite similar to the Client info, but this time showing the MAC of the Client radio as seen below.



When the Aiming Mode is operational, begin making your alignment adjustments. Be sure to make small adjustments, and mark or remember the positioning when you first start to see link numbers reported so you can always return to that point if you lose alignment.

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Aiming Mode - PTMP

The Aiming Mode usage in PTMP modes is quite similar to PTP modes. The PTMP Client is identical to the PTP Client. The PTMP Master is slightly different however, in that instead of displaying a signal bar for a single Client, it can show multiple Aiming Peers at one time as seen below. This is done so that you can monitor multiple Client devices being aimed at the Master from the Master side at once. The signal bars are not used because of a slightly different internal operational topology with regards to how the Aiming Peers reporting mechanism operates, and also because you normally aren't making adjustments on the Master (typically one of the sector antenna units) for a single client.

The screenshot shows a window titled "AIMING PEERS" with a close button (X) in the top right corner. Below the title, there is a text box stating: "The table below will show any nearby MetroLinq peers that are in aiming mode." Below this text is a table with the following data:

MAC address	Local RSSI	Local SNR	Remote RSSI	Remote SNR
28:76:10:06:F6:06	-48	25	-48	25
28:76:10:06:F6:5D	-47	25	-47	25

At the bottom of the window, there are two buttons: a green "START" button and a grey "STOP" button.

Linq Assist

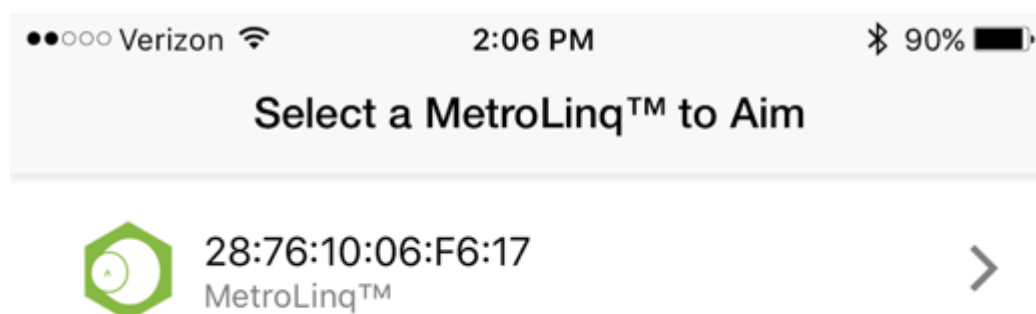
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The new Linq Assist™ app puts the power of this new Aiming Mode in the palm of your hand. Available for iOS and Android operating systems, Linq Assist allows you to use your mobile device to quickly and easily see alignment information while directly making alignment adjustments without handling a bulky laptop or relaying signal levels back and forth from someone on the ground. Utilizing a bluetooth USB dongle that you insert into the MetroLinq radio you'd like to aim, Linq Assist is able to communicate with the MetroLinq radio itself to poll and display local and remote signals in real time.

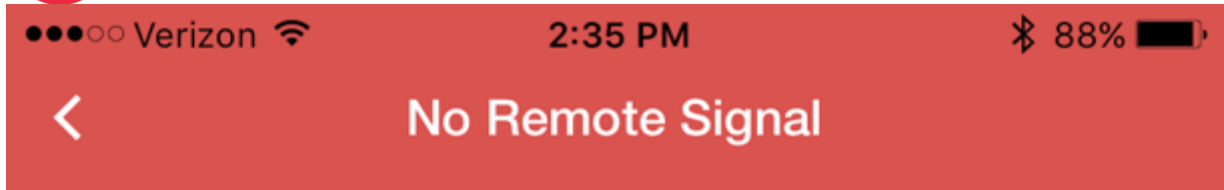
To use Linq Assist, open the app and look for the 60Ghz interface MAC address of the MetroLinq device into which you've installed the bluetooth USB dongle. You can see this in the picture below, where the bluetooth USB dongle is installed into the PTP-Client radio from before which has a 60Ghz MAC of 28:76:10:06:F6:17.



Click on the desired radio and the connection will establish and the app will display alignment info from the radio. Please note that Aiming Mode on the unit/link in question must be enabled in the GUI before it will report data to the app. If Aiming Mode is not enabled, or if it is enabled and there are no signals seen because of the alignment, you will see the screen below.

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28:76:10:06:F6:17

MetroLinq™

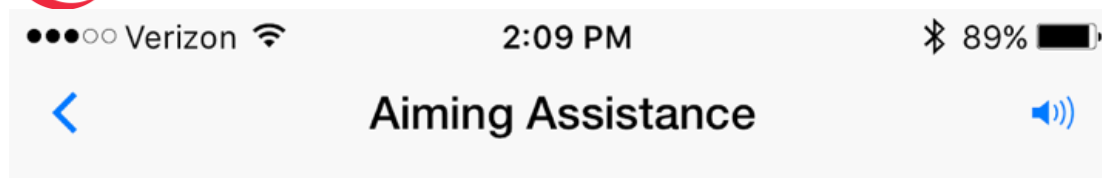
This MetroLinq™ is receiving no signal from the remote end of the connection.

Please make sure the MetroLinq™ is in aiming mode and aimed in the direction of the remote end.

Slowly begin making alignment adjustments, and once the local end sees signal info from the other side then it will display on the app as seen below.

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28:76:10:06:F6:17

MetroLinq™

Remote MAC: 28:76:10:06:F6:3F



Local SNR: 25 dBm



Remote SNR: 25 dBm



Overall signal quality: good

The app will display the local signal, remote signal, and a combined signal strength. It will also sound an audio tone (the faster the tone interval, the stronger the signal) which can be muted if desired from the volume button on the top right hand corner. Once alignment is finished, leave the app, turn off Aiming Mode in the GUI, and your link will establish and you can pass data across it.

Below are a few additional notes about using Linq Assist:

- The bluetooth USB dongle used is a standard bluetooth 4.0 USB dongle you can purchase from a number of sources. Most units tested from common sources such as this one from [Amazon](#) have worked well. We will also make known compatible dongles available through the distribution chain. The USB port on the MetroLinq unit is to the right of the ETH0/POE port.

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- As pointed out above, Aiming Mode from the GUI must be launched before the app will report any data. However once launched, it doesn't need further interaction until you are done aligning. So you can start it from the ground or other remote location as long as you have GUI access.
- As the app and Aiming Mode both reference the 60Ghz radio MAC address, be sure to take note of the MAC's in use during initial configuration so you have it on hand when aligning.
- The app will display signal info from radios in either of the 4 modes: PTP-Client, PTP-Master, PTMP-Client, or PTMP-Master. The only main difference is that when using it with a PTMP-Master, the app will only show a single Aiming Peer that has the strongest current signal (whereas the GUI will show all Aiming Peers). This isn't usually a problem as you typically aren't making aiming adjustments on a Master that is serving multiple clients. This is mainly pointed out here for reference purposes.
- If you are using the app on a Client that sees multiple Masters on the same channel, the GUI will display all Masters but the app will only display a single Master that has the strongest signal.

Compatible Bluetooth Dongle is available in Amazon see below link:

https://www.amazon.co.uk/gp/product/B073R7M2XW/ref=oh_aui_detailpage_o00_s00?ie=UTF8&psc=1

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